

FORUM



Aquatic and Wetland Plants: Wet & Wild

THE ANNUAL MEETING OF FOUR
PROFESSIONAL SOCIETIES

BOTANICAL SOCIETY OF AMERICA
AMERICAN SOCIETY OF PLANT TAXONOMISTS
AMERICAN BRYOLOGICAL AND LICHENOLOGICAL SOCIETY
AMERICAN FERN SOCIETY

July 26-31, 2003
Arthur R. Outlaw Convention Center
Mobile, Alabama

Adam's Mark Hotel

Meeting Room Floor Plan

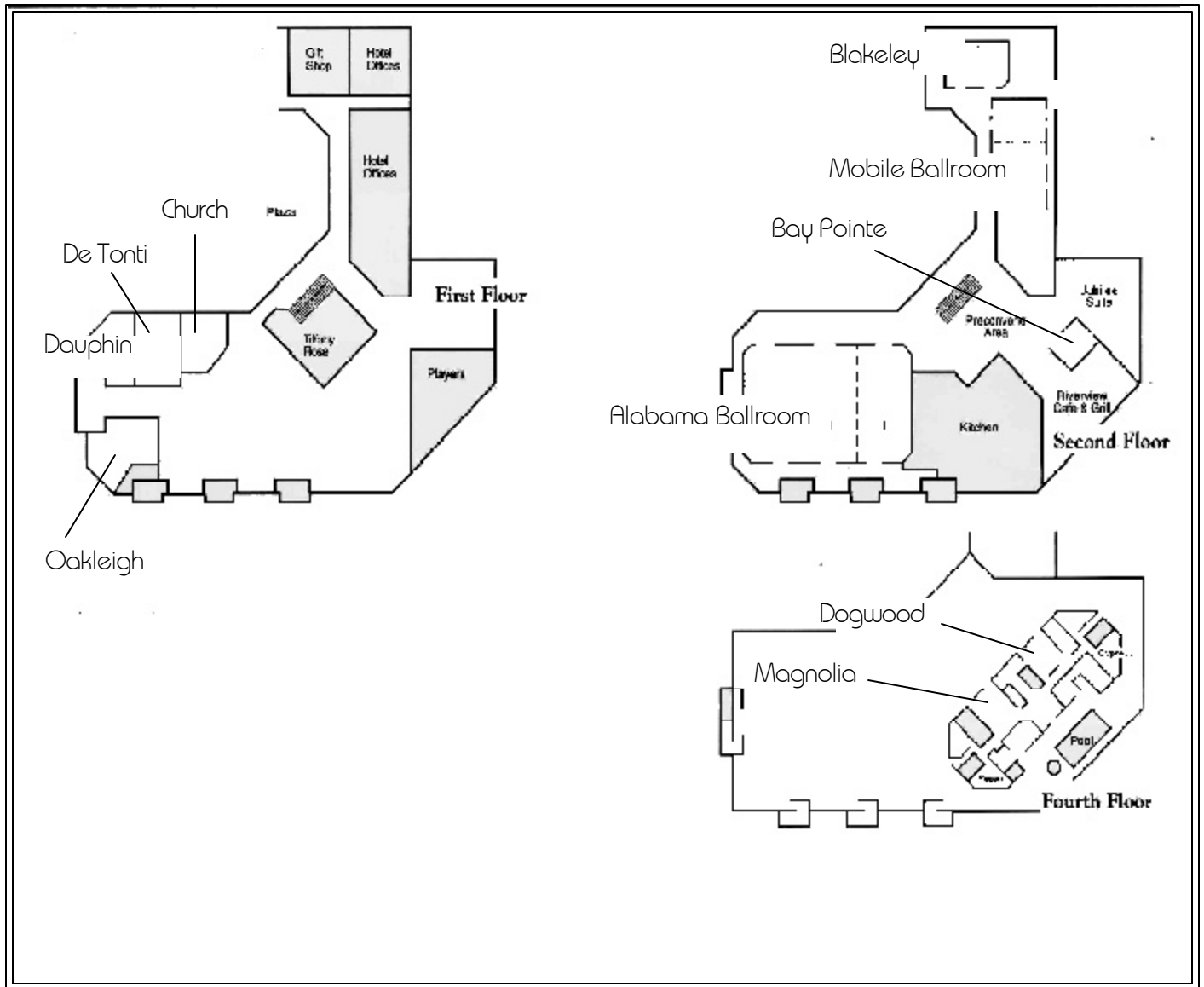


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Participating Societies



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AMERICAN SOCIETY OF PLANT TAXONOMISTS

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Iowa State University

AMERICAN BRYOLOGICAL AND LICHENOLOGICAL SOCIETY

William Buck, President

New York Botanical Garden

AMERICAN FERN SOCIETY

Christopher Haufler, President

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“...Teaching students about plant biology is as critical to the future of the field as is research and must take its proper place as an equally laudatory endeavor for botanists. Equally vital are activities that communicate the excitement of plant biology to students and teachers involved in K-12 education and to the general public...”

This passage from the *Botany for the Next Millennium* Report (BSA, 1995) emphasizes the important role of education and outreach, at all levels. However, there continues to be a reduction in the number of Botany courses taught at the undergraduate level and many Botany Departments and programs have been eliminated nationwide. Despite this, the global significance of plants continues to grow. It is therefore vital that botanists and their professional societies work to ensure that plants are represented in the undergraduate and graduate curriculum, as well as in science outreach initiatives. This was the impetus for the decision to expand the program of the annual BOTANY conference.

The BOTANY 2002 conference held in Madison, Wisconsin included the inaugural education/outreach FORUM. Approximately 1,000 plant biologists attended the overall conference, and 300 of these traveled to Madison early to attend the FORUM. Attendees completed evaluation forms of the FORUM program and found it to be a valuable and refreshing addition to annual conference. The Program Committee was also delighted with the FORUM program and the enthusiastic response of the attendees. Therefore, BOTANY 2003 includes the second FORUM, which is planned to become an annual event.

This year's FORUM begins on Friday evening, July 25, with early registration and a welcoming reception. The main FORUM program occurs on Saturday, July 26, with a Key-note Address by Dr. Bruce Alberts, President of the Na-

tional Academy of Sciences, titled “Science Education and the National Science Education Standards: The Challenges Ahead,” and 14 one-hour sessions, including two on funding opportunities available at the National Science Foundation (NSF). The individual sessions are grouped within six topical themes, or ‘threads,’ that span the FORUM program, and these have been scheduled such that those from the same thematic thread don't overlap at the same time slot. A range of topics will be addressed in interactive panel and roundtable discussions, breakout groups, as well as informational sessions.

On Sunday, July 27, the FORUM is formally linked to the annual scientific meeting via workshops and field trips, for which attendees register separately. Eight hands-on workshops are available as two-hour, half-day, and full-day events. One workshop is sponsored by the Deep Gene Research Coordination Network and is free to registrants.

Although the principal focus of the FORUM is undergraduate education and related outreach, K-12 teachers have been invited and encouraged to participate, and several hands-on workshops are targeted for K-12 educators.

The FORUM is sponsored in part by the National Science Foundation (NSF), the Deep Gene Research Coordination Network, Project Kaleidoscope (PKAL), and the Council on Undergraduate Research (CUR), and their support is greatly appreciated.

Registration & Meeting Information



REGISTRATION PAYMENT

Checks and credit cards are the only acceptable forms of payment for registration. Wire transfers and purchase orders are not accepted.

REGISTRATION AREA

On-site registration, pick-up of registration packets for those who have pre-registered, and late purchase of workshop tickets can be done at the BOTANY 2003 Registration Desk. The Registration desk will be located in the Pre-Function Area of the Adam's Mark Hotel on Friday and Saturday and in the Convention Center on Sunday, and it will be open during the following times:

Friday July 25 6:00 pm to 9:00 pm
Saturday July 26 8:00 am to 6:00 pm
Sunday July 27 8:00 am to 6:00 pm

CHILD CARE

Child care can be arranged by directly calling: My Favorite Nanny at 251-634-0145.

Attendees are completely responsible for making their own arrangements with the provider. BOTANY 2003 assumes no responsibility for any difficulties or consequences arising from the use of a child care provider and recommends that the provider be screened carefully.

COFFEE BREAKS

Complimentary coffee breaks will be held in the Oakleigh Room at specific times each day. Check the Final Program for times.

FEDERAL TAX ID NUMBER

The Federal Tax ID number for the Botanical Society of America is: 62-0671591.

MESSAGE & ANNOUNCEMENT BOARDS

Messages for conference attendees will be able to be posted on message boards, which will be located in the Registration areas. A "Positions Available" board will also be available for postings.

REFUND AND CANCELLATION POLICY

Requests for registration fee refund will be honored if received in writing before June 24, 2003 to:

BOTANY 2003 Registration Center
PO Box 714079
Columbus, OH 43271-4079

Registration fee refunds will be subject to a \$50 processing fee. Fieldtrips and Local Tour, Social Event and Workshop fees are non-refundable if cancelled after June 24, 2003.

Full fee refunds will be granted for Social Events, Scientific Field Trips, Local Tours, and Workshops if they exceed maximum enrollment, do not meet minimum enrollment, or if cancelled for any reason.

ALL refunds will be issued AFTER the conference.

CONFERENCE HOUSING

Several housing options are available for BOTANY 2003, including the Adam's Mark (the host hotel), the Radisson Admiral Semmes Hotel and dormitory options at Spring Hill College. Conference attendees should make their own reservations directly with the facility of their choice.

SPECIAL SERVICES

If you require special accommodations, assistance or services during the conference, please talk with a BOTANY 2003 representative at the registration desk.

THE BOTANY 2003 LOGO

The BOTANY 2003 logo was created by
Deane Arnold, Graphic Designer and Illustrator
E-mail: deane.arnold@att.net

CONCURRENT SESSIONS

Four types of sessions are included in the FORUM program, and the general guidelines for these are noted below. Organizers were able to select the most appropriate type of session for their topic. Although the organizers may approach their sessions in other fashions, the overall goal is for the sessions to be as interactive as possible and to provide ample time for questions and dialogue. All sessions are one-hour in length.

Informational Session - A presentation by one to three speakers in which specific information is conveyed. Informational sessions should leave a minimum of 20 minutes for questions and answers.

Breakout Session - An introduction by one to three facilitators followed by time for in-depth discussion or an organized activity that engages the audience. Two thirds of the time period should be devoted to discussion and interaction. A breakout session often culminates in some type of a commitment, such as group recommendations or personal agendas for future implementation.

Panel Session - Two to four panel members including a moderator, each of which may give a brief introduction, followed by discussion among them and with the audience. Half of the time period should involve audience participation.

Roundtable Session - A roundtable is a freewheeling discussion, usually with multiple viewpoints. The discussion is facilitated by a moderator, but there are no formal speakers. The moderator sets the stage for the discussion by providing one or two provocative questions. Virtually the entire session is interactive.

AUDIO-VISUAL INFORMATION

BOTANY 2003 provides the opportunity for presenters to deliver computer-based presentations as a standard presentation option. Overhead projectors and flip charts will also be available as standard options for the FORUM.

The Pentium III computers that will be provided within the Convention Center use Windows 2000 and Office 2000 suite including PowerPoint. The PowerPoint application will handle older versions as well as Macintosh saved as a 2000 or earlier version file.

For computer presentations, files will be accepted on CD ROMs, 3.5 floppy or 100MB Zip media. A centralized network will not be available.

PREVIEW ROOM

A presentation preview room is available in the Mobile Convention Center (room 211) from 8:00 am - 5:00 pm on Saturday and Sunday, July 26 and July 27. The preview room will have a computer and projector on these two days.

PRESENTERS' ASSISTANCE ROOM

A Presenter's Assistance Room will be available in the Mobile Convention Center (room 212) to help with Presenters' questions and needs for all sessions. The Presenters' Assistance Room will be open at the following times:

Saturday, July 26.....8:00 am to 9:00 am
Sunday, July 27.....11:00 am to 4:00 pm



DR. BRUCE ALBERTS

PRESIDENT, NATIONAL ACADEMY OF SCIENCES

Science Education and the National Science Education Standards: The Challenges Ahead

Saturday, July 26, 2003

11:00 am

Adam's Mark Hotel - Mobile Ballroom

Bruce Alberts, President of the National Academy of Sciences in Washington, D.C., is a respected biochemist recognized for his work both in biochemistry and molecular biology. He is noted particularly for his extensive study of the protein complexes that allow chromosomes to be replicated, as required for a living cell to divide.

He has spent his career making significant contributions to the field of life sciences, serving in different capacities on a number of prestigious advisory and editorial boards, including as chair of the Commission on Life Sciences, National Research Council. Until his election as President of the Academy, he was President-elect of the American Society of Biochemistry and Molecular Biology.

Born in 1938 in Chicago, Illinois, Alberts graduated from Harvard College in Cambridge, Massachusetts, with a degree in biochemical sciences. He earned a doctorate from Harvard University in 1965. He joined the faculty of Princeton University in 1966 and after ten years was appointed Professor and Vice Chair of the Department of Biochemistry and Biophysics at the University of California, San Francisco (UCSF). In 1980, he was awarded the honor of an American Cancer Society Lifetime Research Professorship. In 1985, he was named chair of the UCSF Department of Biochemistry and Biophysics.

Alberts has long been committed to the improvement of science education, dedicating much of his time to educational projects such as City Science, a program seeking to improve science teaching in San Francisco elementary schools. He has served on the advisory board of the National Science Resources Center, a joint project of the National Academy of Sciences and the Smithsonian Institution working with teachers, scientists, and school systems to improve teaching of science, as well as on the National Academy of Sciences' National Committee on Science Education Standards and Assessment.

He is one of the original authors of *The Molecular Biology of the Cell*, now in its 4th edition. Considered the leading textbook of its kind, it is used widely in colleges and universities around the world. His most recent text, *Essential Cell Biology* (1998), is intended to approach this subject matter for a wider audience.

For the period 2000 to 2005, Dr. Alberts is the Co-chair of the InterAcademy Council, a new advisory institution in Amsterdam governed by the presidents of the science academies of 15 different nations.

Workshop Schedule



All Workshops will be held on Sunday, July 27. Please read the Refund and Cancellation Policy. Workshops are ticketed events; tickets may be purchased while registering and will be included in the registration packet. If you participate in a Workshop(s) before acquiring your registration packet, bring your registration confirmation notice so that you have a record of your purchased ticket. Workshops will be held in the Mobile Convention Center (MCC) and at University of Southern Alabama (USA) campus (transportation will be provided). Buses will leave from the Lobby of the Convention Center at the time specified on your ticket.

MORNING

8 am - 10 am	W-1	Producing, Publishing, and Sharing Curriculum Materials in the Plant Sciences (USA - LSCB 139)
8 am - 12 pm	W-2	Plant Biologists Reaching Out: Planning and Delivering Teacher Workshops (USA - LSCB 240)
8 am - 12 pm	W-3	Getting to the Roots of Plant Evolution: Genomics and the Reconstruction Tree of Life (USA - LSCB 137)
8 am - 12 pm	W-4	Tips on Writing NSF-CCLI Proposals (MCC - 202A)



AFTERNOON

1 pm - 5 pm	W-6	Implementing A Cooperative Group Learn Environment in Hands-On Biology Labs for Nonmajors: Lessons from the Trenches (LSCB-240)
1 pm - 5 pm	W-7	Conservation Status & Management of Bog Communities in the Southeastern US (USA - LSCB 139)
1 pm - 3 pm	W-8	Teaching through Inquiry (MCC - 203B)



ALL DAY

8 am - 5 pm	W-5	Using Lucid Software for Making Interactive Keys (USA - LSCB 131)
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MORNING

W-1 Producing, Publishing, and Sharing Curriculum Materials in the Plant Sciences.....\$25.00

8 am - 10 am
University of South Alabama - LSCB 139

Presenter: Michael W. Clayton, Department of Botany, University of Wisconsin - Madison, Madison, WI 53706, 608-262-2333, clayton@wisc.edu

Target Audience: Teachers all levels

Producing course-specific curriculum materials allows educators to better focus on specific learning objectives. This is particularly important for the teaching laboratory where students can become distracted by non essential procedures and awkward formatting. Using multimedia, the production of quality teaching materials, such as lab manuals and web-based lessons, is easily in the grasp of any dedicated teacher. In this workshop, we will share and discuss some of the curriculum materials we have developed at the University of Wisconsin with an emphasis on the learning objectives underlying the creation of these materials, and the methods used in their development. The materials demonstrated, may be used and modified by the participants after the workshop. These, and other resources useful for the development of customized course materials, are available through the University of Wisconsin-Madison. Our materials may be freely sampled via the web page at <http://botit.botany.wisc.edu>. Rights of distribution are granted through the purchase of our CD, Multimedia Toolkit for Educators in the Life Sciences. Proceeds from the sale of CDs are returned to the university to support undergraduate education. We hope this workshop will encourage others to follow our lead in producing and distributing materials aimed towards educators who desire to author their own curriculum content.



W-2 Plant Biologists Reaching Out: Planning and Delivering Teacher Workshops.....\$50.00

8 am - 12 pm
University of South Alabama - LSCB 240

Presenters: D. Timothy Gerber, University of Wisconsin - La Crosse, La Crosse, Wisconsin 54601, gerber.dani@uwla.edu; and

David W. Kramer, Ohio State University at Mansfield, Mansfield, Ohio 44906, kramer.8@osu.edu

Target Audience: Faculty and Graduate Students

The Botanical Society's report *Botany for the Next Millennium* (BSA, 1995) charges each of us to elevate the importance of effective teaching in our own institutions. But it doesn't stop there! It goes on to say, "Equally vital are activities that communicate the excitement of plant biology to students and teachers involved in K-12 education and to the general public." Many plant biologists in universities have limited experience in working with teachers at other levels of education. Those who want to accept this challenge soon discover there is much to know about outreach to pre-service and in-service teachers. The organizers of this workshop have delivered successful workshops for teacher professional development and want to share what they have learned. But this workshop's goal is to move beyond "show and tell." Participants will begin planning their own teacher workshops. Planning in this setting will allow you to ask critical questions relating to goals, content, hands-on activities, effective use of technology, curriculum integration, recruiting, funding, follow-up, and other elements.

W-3 Getting to the Roots of Plant Evolution: Genomics and the Reconstruction Tree of Life.....FREE

8 am - 12 pm
University of South Alabama - LSCB 137

Presenter: Brent Mishler, University and Jepson Herbaria, University of California, Berkeley, Berkeley, CA 94720-2465, bmishler@socrates.Berkeley.edu

Target Audience: High School Teachers & Faculty and Graduate Students

Phylogenetic analyses using molecular and morphological data have yielded stunning results about the tree of life and how all organisms on earth are related to each other.

The use of phylogenetic methods to understand evolutionary history has become a common theme throughout science. Understanding the concepts and basic methodology of these relatively new techniques is an important component of science education at the high school and undergraduate college levels.

This workshop will provide an introduction to phylogenetic methods using examples from the green plants. Using material that is easily accessible nationwide, we will conduct a hands on demonstration of a classroom exercise appropriate for grades 9 - 12 and introductory biology classes at the university level. Using a simple phylogenetic analysis with morphological and genomic data, we will explore the evolutionary relationships of land plants. Results will be used to discuss adaptation to life on land, radiation of the angiosperms, molecular evolution, and the new classification of green plants.

This workshop will provide a foundation for students to (1) conduct a scientific investigation by collecting, categorizing, and analyzing data, (2) read and analyze data summarized in a cladogram, and (3) understand basic evolutionary concepts such as adaptation, diversification, symbiosis, and convergent evolution.

Sponsored by the National Science Foundation (Grant DEB-0090227), The Deep Gene Research Coordination Group exists to integrate green plant phylogenetics and genomics. The group is exploring ways in which comparative phylogenetic studies can inform functional genomic studies, and knowledge of plant genomes can inform the understanding of phylogenetic relationships. For more information, please visit our web site (<http://ucjeps.herb.berkeley.edu/bryolab/deepgene/>).

W-4 Tips on Writing NSF-CCLI Proposals.....\$10.00

8 am - 12 pm
Convention Center - Room 202A

Presenter: Katherine Denniston, National Science Foundation, Division of Undergraduate Education (DUE), 4201 Wilson Boulevard, Suite 840, Arlington, Virginia 22230, 703-292-4620, kdennist@nsf.gov

Target Audience: Undergraduate/Graduate

This session will highlight NSF Division of Undergraduate Education Course, Curriculum, and Laboratory Improvement (CCLI) program. We will begin with an overview of the four tracks of the CCLI program: Educational Materials Development (EMD), Adaptation and Implementation (A&I), National Dissemination (ND), and Assessment of Student Achievement (ASA). We will discuss the key characteristics of a competitive proposal, using examples of funded

botany projects. We will also consider the proposal submission/review/award process, as well as the "Seven Top Ways to Blow a Proposal." Our intent is to help you take your idea and turn it into the most competitive proposal possible. Attendees will participate in a simulated panel review using an actual funded proposal in order to get a deeper understanding of the review process. We will discuss how the review process should impact proposal development in order to maximize the competitiveness of a submitted proposal.



AFTERNOON

W-6 Implementing A Cooperative Group Learning Environment in Hands-On Biology Labs for Nonmajors: Lessons from the Trenches.....\$27.00

1 pm - 5 pm
University of South Alabama - LSCB 240

Presenter: Staria Vanderpool, Department of Biological Sciences, Arkansas State University, State University, AR 72467, svand@astate.edu

Target Audience: Undergraduate/Graduate

A hands-on workshop for people who may be considering modification of lab experiences for nonmajors biology lab from a traditional confirmatory/demonstration model to an investigational model. During the past three years our department has been involved in a transition to problem-based investigational labs for the nonmajor biology lab.

Our typical annual student enrollment in the lab is 1500 students so there are significant logistical problems involved in developing, staffing, and managing this laboratory environment. Solutions to some of these problems include using a cooperative learning method, multi-week labs, and concentration on the process of scientific investigation. Student response has been increasingly positive as we have resolved implementation problems. Assessment of the effectiveness of the change indicates significant increase in the student's overall interest in science, understanding of the use of science reasoning, and the role of science in non-science careers thus validating the role of laboratory sciences as part of the general education component of the undergraduate degree program.

W-7 Conservation Status & Management of Bog Communities in the Southeastern US\$25.00

1 pm - 5 pm
University of South Alabama - LSCB 139

Presenters: Lawrence R. Stritch and Levester Pendergrass, USFWS/NCTC, Route 1 Box 166, Shepherdstown, WV25401, 304-876-7466, lstritch@fs.fed.us

Target Audience: Undergraduate/Graduate

The purpose of this workshop is to raise awareness of bog communities in the southeastern, U.S. This workshop proposes to have an introductory speaker to introduce the topic. A speaker will follow this from TNC that will discuss the classification of bog communities in the southeast and their conservation status. The remainder of the workshop will address various management concerns such as fire ecology, woody encroachment, invasive species, water management, etc. Management experts will address these management topics. The workshop will conclude with a panel of the management presenters available for questions from the participants.

**W-8 Teaching through Inquiry.....\$15.00**

1 pm - 3 pm
Convention Center - Room 203B

Presenter: Gordon Uno, Department of Botany and Microbiology, University of Oklahoma, Norman, OK 73019-6131, guno@ou.edu

Target Audience: High School Teachers & Graduate Students/Undergraduate Faculty

Inquiry, which has been recognized as the method to drive science education reform, helps students discover and construct an understanding of scientific concepts on their own under the guidance of the instructor. This workshop will introduce participants to different kinds of inquiry and the general techniques of inquiry instruction using a variety of short, hands-on activities and information about the Introductory Botany course at the University of Oklahoma, which is taught using this method.

In addition, participants will learn how to develop "discovery" activities on their own and how to make traditional laboratories more inquiry-oriented. We will also address the most common problems in teaching biology today, with suggestions and examples of how to deal with or overcome these problems. This workshop will introduce participants to a new biology education initiative from the American Institute of Biological Sciences (AIBS); ideas for the initiative will be solicited.

ALL DAY

W-5 Using Lucid Software for Making Interactive Keys.....\$140.00

8 am - 5 pm
University of South Alabama - LSCB 131

Presenters: Neil Snow and Jeffrey Brasher, Department of Biological Sciences, University of Northern Colorado Greeley, CO 80639, neil.snow@unco.edu; and

Geoff Norton, Centre for Pest Information and Technology Transfer, University of Queensland St. Lucia, QLD Australia

Target Audience: Undergraduate/Graduate

This workshop will provide in-depth coverage of Lucid software for writing and disseminating interactive keys. It will include instruction on the use of Lucid Builder, Lucid Player, key design and implementation, and discuss platform requirements and installation. Each participant will need to bring a pc laptop. Workshop participants will be able to purchase Lucid at a reduced rate.



Professional scientific societies can play a major role in positively influencing the undergraduate curriculum, as well as science outreach initiatives at all levels. This was the impetus for the decision to expand the program of the annual conference. We are excited about enhancing the educational component of our Societies' missions with this year's Forum. This conference component will focus once again, on botanical education and outreach and we greatly appreciate the support of our sponsors.

This year's Forum is sponsored in part by the National Science Foundation (NSF), Project Kaleidoscope (PKAL), the Council on Undergraduate Research (CUR), and the Deep Gene Research Coordination Network.

The National Science Foundation (NSF)

4201 Wilson Boulevard
Arlington, Virginia 22230
Tele: (703) 292-5111
Web: <http://www.nsf.gov>



The Deep Gene Research Coordination Network

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Web: <http://ucjeps.herb.berkeley.edu/bryolab/deepgene/>



Project Kaleidoscope (PKAL)

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The Council on Undergraduate Research (CUR)

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Web: <http://www.cur.org>



FRIDAY, JULY 25, 2003 _____

6:00 pm - 9:00 pm **Informal Welcoming Reception**
(Adam's Mark, Mobile Ballroom)

SATURDAY, JULY 25, 2003 _____

8:00 am - 6:00 pm **Registration**
(Adam's Mark, Pre-function I)

8:15 am - 9:15 am **Concurrent Sessions 1**

- 1-1 Enhancing botany experiences in ecology and evolution laboratories (Adam's Mark, Church)
- 1-2 Approaches to teaching botany to non-majors (Adam's Mark, De Tonti)
- 1-3 The SIU SYSTEM: A model program for supporting youth with disabilities in science (Adam's Mark, Dauphin)

9:30 am - 10:30 am **Concurrent Sessions 2**

- 2-1 Teaching the 'Tree of life' for plants (Adam's Mark, Church)
- 2-2 Making the most of NSF Division of Undergraduate Education funding opportunities (Adam's Mark, De Tonti)
- 2-3 Attracting botany graduate students to smaller schools (Adam's Mark, Dauphin)

10:30am - 11:00 am **Break** (Adam's Mark, Oakleigh)

11:00 am - 12:00 pm **Keynote Address**
(Adam's Mark, Alabama Ballroom)

Dr. Bruce Alberts
"Science Education and the National Science Education Standards: The challenges ahead"

12:00 pm - 1:30 pm **Lunch Break**

1:30 pm - 2:30 pm **Concurrent Sessions 3**

- 3-1 Running NSF Research Experience for Undergraduates (REU) site programs (Adam's Mark, Church)
- 3-2 Facilitating interaction in large lecture courses (Adam's Mark, De Tonti)
- 3-3 Where's botany in the news? Strategies for linking up with the media (Adam's Mark, Dauphin)

2:45 pm - 3:45 pm **Concurrent Sessions 4**

- 4-1 Promoting botany beyond undergraduate curriculum requirements (Adam's Mark, Church)
- 4-2 NSF funding opportunities that support undergraduate research (Adam's Mark, De Tonti)

3:45 pm - 4:15 pm **Break** (Adam's Mark, Oakleigh)

4:15 pm - 5:15 pm **Concurrent Sessions 5**

- 5-1 What are the essential topics about evolution that under graduates need to understand?: A focus on plant biology (Adam's Mark, Church)
- 5-2 Best practices and biggest challenges in the botanical classroom and lab (Adam's Mark, De Tonti)
- 5-3 Integrating research and teaching: Using the class room to feed your scholarship (Adam's Mark, Dauphin)

5:15 pm - 7:00 pm **Reception**
(Adam's Mark, Mobile Ballroom)

SUNDAY, JULY 27, 2003 _____

8:00 am - 5:00 pm **Concurrent workshops and field trips**

FRIDAY, JULY 25, 2003

6:00 pm - 9:00 pm
INFORMAL WELCOMING RECEPTION

Adam's Mark, Mobile Ballroom

SATURDAY, JULY 26, 2003

8:15 am - 9:15 am
SESSION 1

Adam's Mark

- 1-1 Enhancing botany experiences in ecology and evolution laboratories**
JENNIFER A. CLEVINGER, *James Madison University, Harrisonburg VA.*
Informational Session
Adam's Mark, Church

- 1-2 Approaches to teaching botany to non-majors**
DAVID W. LEE and JENNIFER RICHARDS, *Florida International University, Miami.*
Breakout Session
Adam's Mark, De Tonti

- 1-3 The SIU SYSTEM: A model program for supporting youth with disabilities in science**
KAREN S. RENZAGLIA AND PAUL E. BATES, *Southern Illinois University, Carbondale.*
Informational Session
Adam's Mark, Dauphin

9:30 am - 10:30 am
SESSION 2

Adam's Mark

- 2-1 Teaching the 'Tree of life' for plants**
BRENT D. MISHLER and STACI MARKOS, *University of California–Berkeley.*
Informational Session
Adam's Mark, Church

- 2-2 Making the most of NSF Division of Undergraduate Education funding opportunities**
KATHERINE DENNISTON, *National Science Foundation, Arlington, VA.*
Informational Session
Adam's Mark, De Tonti

- 2-3 Attracting botany graduate students to smaller schools**
BRUCE K. KIRCHOFF, *University of North Carolina, Greensboro.*
Breakout Session
Adam's Mark, Dauphin

10:30 am - 11:00 am
BREAK

Adam's Mark, Oakleigh

11:00 am - 12:00 pm
KEYNOTE ADDRESS

Adam's Mark, Alabama Ballroom I-II

Presiding: SCOTT RUSSELL, *President, Botanical Society of America. University of Oklahoma, Norman.*

Speaker: BRUCE ALBERTS, *President, National Academy of Sciences. Washington, DC.* Science Education and the National Science Education Standards: The challenges ahead.

12:00 pm - 1:30 pm
LUNCH BREAK

On your Own

1:30 pm - 2:30 pm
SESSION 3

Adam's Mark

3-1 Running NSF Research Experience for Undergraduates (REU) site programs

TOM BULTMAN¹ and MARSHALL SUNDBERG², ¹*Hope College, Holland, MI* and ²*Emporia State University, Emporia, KS.*

Panel Session

Adam's Mark, Church

3-2 Facilitating interaction in large lecture courses

SUZANNE KOPTUR, *Florida International University, Miami.*

Informational Session

Adam's Mark, De Tonti

3-3 Where's botany in the news? Strategies for linking up with the media

SUSAN MILIUS, *Science News magazine, Washington, DC.*

Roundtable Session

Adam's Mark, Dauphin

2:45 pm - 3:45 pm
SESSION 4

Adam's Mark

4-1 Promoting botany beyond undergraduate curriculum requirements

RANESSA L. COOPER, *Hillsdale College, Hillsdale, MI.*

Informational Session

Adam's Mark, Church

4-2 NSF funding opportunities that support undergraduate research

JUDITH E. SKOG, *National Science Foundation, Arlington, VA.*

Informational Session

Adam's Mark, De Tonti

3:45 pm - 4:15 pm
BREAK

Adam's Mark, Oakleigh

4:15 pm - 5:15 pm
SESSION 5

Adam's Mark

5-1 What are the essential topics about evolution that undergraduates need to understand?: A focus on plant biology

STANLEY A. RICE, *Southeastern Oklahoma State University, Durant.*

Roundtable Session

Adam's Mark, Church

5-2 Best practices and biggest challenges in the botanical classroom and lab

BEVERLY J. BROWN, *Nazareth College of Rochester, Rochester, NY.*

Breakout Session

Adam's Mark, De Tonti

5-3 Integrating research and teaching: Using the classroom to feed your scholarship

JEFFREY M. OSBORN, *Truman State University, Kirksville, MO.*

Breakout Session

Adam's Mark, Dauphin

5:15 pm - 7:00 pm
RECEPTION

Adam's Mark, Mobile Ballroom

EMPHASIZING BOTANY ACROSS THE CURRICULUM

Teaching the 'Tree of life' for plants (Session 2-1)

What are the essential topics about evolution that undergraduates need to understand?

A focus on plant biology (Session 5-1)

Promoting botany beyond undergraduate curriculum requirements (Session 4-1)

DESIGNING INVESTIGATIVE LABORATORIES

Enhancing botany experiences in ecology and evolution laboratories (Session 1-1)

ENGAGING UNDERGRADUATES IN RESEARCH

NSF funding opportunities that support undergraduate research (Session 4-2)

Running NSF Research Experience for Undergraduates (REU) site programs (Session 3-1)

Integrating research and teaching: Using the classroom to feed your scholarship (Session 5-3)

DEVELOPING EFFECTIVE TEACHING AND MENTORING SKILLS

Best practices and biggest challenges in the botanical classroom and lab (Session 5-2)

SUPPORTING EFFECTIVE TEACHING AND LEARNING

Making the most of NSF Division of Undergraduate Education funding opportunities (Session 2-2)

Approaches to teaching botany to non-majors (Session 1-2)

Attracting botany graduate students to smaller schools (Session 2-3)

Facilitating interaction in large lecture courses (Session 3-2)

REACHING OUT BEYOND THE IVORY TOWERS

Where's botany in the news? Strategies for linking up with the media (Session 3-3)

The SIU SYSTEM: A model program for supporting youth with disabilities in science (Session 1-3)

EMPHASIZING BOTANY ACROSS THE CURRICULUM

1 Teaching the 'Tree of Life' for plants

Organizers: BRENT D. MISHLER and STACI MARKOS, University and Jepson Herbaria, 1001 VLSB #2465, Berkeley, CA 94720, Tele: (510) 643-7008, Fax: (510) 643-5390, E-mail: bmishler@socrates.berkeley.edu, and smarkos@socrates.berkeley.edu.

Other Participants: KAREN S. RENZAGLIA, Department of Plant Biology, 1125 Lincoln Drive, Southern Illinois University, Carbondale IL 62901-6509, Tele: (618) 453-3229, Fax: (618) 453-3441, E-mail: renzaglia@plant.siu.edu; CHARLES J. O'KELLY, Bigelow Laboratory for Ocean Sciences, P. O. Box 475, 180 McKown Point Road, West Boothbay Harbor, ME 04575, Tele: (207) 633-9600, Fax: (207) 633-9641, E-mail: cokelly@bigelow.org; and JEFFREY D. WITTERS, Department of Plant Biology, 1125 Lincoln Drive, Southern Illinois University, Carbondale IL 62901-6509, Tele: (618) 453-3229, Fax: (618) 453-3441, E-mail: jeffwitters@hotmail.com.

The green plants represent one of the biggest branches of the tree of life — more than 1/2 million species — a clade at least 1 billion years old. Their morphological and chemical diversity, ecological dominance, and importance in human affairs (for food, shelter, and medicines) are paramount among life's lineages. Recent research results have radically restructured the tree of life as we know it.

This session will discuss the tree of life for plants, specifically evolution, phylogenetics, and genomics (and their interrelationships). The panel will focus on two main goals: (1) summarizing recent research progress, and (2) discussing which facts and conceptual themes are best included across the curriculum, and how. The session is designed for all science teachers interested in incorporating plant evolution into their classrooms. Discussion will focus on the lines of evidence used to understand plant relationships (morphology, genomic characteristics, DNA sequences) and using phylogenetic research as a model of scientific inquiry. Plant evolution provides an interesting, and less contentious, alternative to teaching evolution through mammalian examples.

Note that there will be also a hands-on workshop presented Sunday (W-3 – "Getting to the Roots of Plant Evolution: Genomics and the Reconstruction Tree of Life") that will extend this discussion into laboratory practice.

This session is sponsored by two National Science Foundation supported projects: The Green Tree of Life (<http://ucjeps.berkeley.edu/TreeofLife/>), Deep Gene (<http://ucjeps.herb.berkeley.edu/bryolab/deepgene/index.html>).

Informational Session (Session 2-1)

2 What are the essential topics about evolution that undergraduates need to understand? A focus on plant biology

Organizer: STANLEY A. RICE, Department of Biological Sciences, Southeastern Oklahoma State University, Durant OK 74701-0609. Tele: (580) 745-2688, Fax: (580) 745-7459, E-mail: srice@sosu.edu.

Almost all plant biology educators consider evolution to be an essential topic, particularly in response to efforts by anti-evolutionists to block, or affix disclaimers to, evolution education. Evolutionary science is a big subject, however, and educators need to prioritize the topics within evolutionary science that we want non-majors, biology or conservation majors, and future botanists to understand. In this discussion, the participants will produce a prioritized list of such topics, and discuss the reasons for them. Topics would be likely to include evolution of herbicide resistance, and bioinformatics. By discussing the participants, classroom and other experiences related to these topics, we will also generate a list of suggestions on how to approach these topics most effectively. These lists will be made available electronically to participants who wish them. The discussion leader is particularly interested in broad input on this subject. He is helping to lead efforts in Oklahoma to oppose anti-evolution activism, and is writing a brief, freshman-level encyclopedia of evolution for a major publisher.

Roundtable Session (Session 5-1)

3 Promoting botany beyond undergraduate curriculum requirements

Organizer: RANESSA L. COOPER, Hillsdale College, 33 E. College St., Hillsdale, MI 49242. Tele: (517) 607-2224, Fax: (517) 607-2252, E-mail: Ranessa.Cooper@hillsdale.edu.

The Slayton Arboretum of Hillsdale College has been a valuable resource for teaching botany at the undergraduate level. From course requirements to volunteer opportunities, students have been involved in botany outside of the classroom and laboratory settings. Examples of student involvement in Slayton Arboretum and the biology greenhouse will be presented. Mainly, I will focus on the participation of the Fall 2002 Michigan Flora class with these 'extracurricular' endeavors. I will give my perspectives on implementing botany beyond the curriculum, as well as share some student responses based on their personal experiences. Audience participation is encouraged. The primary goal of this session is to create an open forum for the discussion of ways to promote undergraduate interests in botany.

Informational Session (Session 4-1)

DESIGNING INVESTIGATIVE LABORATORIES

4 Enhancing botany experiences in ecology and evolution laboratories

Organizer: JENNIFER A. CLEVINGER, Department of Biology, MSC 7801, James Madison University, Harrisonburg VA 22801. Tele: (540) 568-7816, Fax: (540) 568-3333, E-mail: clevinja@jmu.edu.

In 2002, the Department of Biology at James Madison University began offering its students a new core curriculum of four courses, each with an accompanying laboratory. The courses, in sequential order, are: Organisms, Ecology and Evolution, Cell and Molecular Biology, and Genetics and Development. With the aid of a NSF-CCLI grant, our faculty have worked to ensure that botany remains an integral part of each student's laboratory experience. In particular, the Ecology and Evolution faculty have developed plant laboratories on the topics of competition, population growth, classification, identification, and sampling. During the six-week competition laboratory, students investigate marigolds and zinnias for the effects of inter-specific and intra-specific competition. During the three-week population growth laboratory, students investigate the effects of pH, salt, and nutrients on the growth of *Lemna* (duckweed). Students learn the principles of keying and identification by keying algae and gymnosperms in the laboratory and then they apply this knowledge in an outdoor exercise on sampling. During the sampling laboratory, students compare tree diversity on different slopes and gain experience identifying local tree species. Throughout the semester students are assessed using laboratory reports, data analysis, tests, and oral presentations.

Informational Session (Session 1-1)

ENGAGING UNDERGRADUATES IN RESEARCH

5 NSF funding opportunities that support undergraduate research

Organizer: JUDITH E. SKOG, Acting Deputy Division Director, Division of Biological Infrastructure, Room 615, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230, Tele: (703) 292-8470, Fax: (703) 292-9063, E-mail: jskog@nsf.gov.

This informational session will feature a presentation about National Science Foundation (NSF) funding opportunities that support undergraduate research. Programs such as Research Experiences for Undergraduates (REU), Undergraduate Mentoring in Environmental Biology (UMEB) Research at Undergraduate Institutions (RUI) and Collaborative Research at Undergraduate Institution (CRUI) will be presented and discussed. A number of other programs that provide supplements to currently

funded NSF awards are also available such as Research Apprenticeship for Minority High School Students (RAMHSS) for high school students, Research Experience for Teachers (RET) for science teachers, Research Opportunity Awards (ROA) for faculty, International Science and Engineering programs (INT) for international activities, and the new Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM), and these will also be presented and discussed. This informational session should be useful to investigators seeking ways of obtaining support for their research and educational activities. A short presentation on preparing a winning proposal will also be included, time permitting.

Informational Session (Session 4-2)

6 Running NSF Research Experience for Undergraduates (REU) Site Programs

Organizers: TOM BULTMAN, Department of Biology, Hope College, Holland, MI 49423, Tele: (616) 395-7372, Fax: (616) 395-7125, E-mail: bultmant@hope.edu; and MARSHALL SUNDBERG, Department of Biology, Emporia State University, Emporia, KS 66801, Tele: (620) 341-5605, Fax: (620) 341-5607, E-mail: sundberm@emporia.edu.

Hope College, a four-year institution, and Emporia State University, a semi-comprehensive institution, each run separate NSF Research Experience for Undergraduates (REU) site programs through funding from the National Science Foundation. The programs support summer research by students from the home institutions as well as by students from other campuses. Student recruitment is accomplished by announcements in biology classes, an informational seminar, advertising posters within the science building, and for off-campus students, mailing an advertising poster to schools across the nation. In addition, each institution erected a web page that fully described the program and the research available and allowed students to apply on-line. Student selection is made based primarily on student commitment and enthusiasm, based on an application letter, grade point average, match with faculty interests, and course work background, and letters of reference at one institution. The Hope program involves students in research in various areas of biology. Students addressed questions ranging from the molecular- to community-level of organization. The Emporia program, which also ranges from molecular to community-level, focuses on questions relating to the tallgrass prairie ecosystems. We will discuss the logistics of each of our programs, including research and workshop activities as well as housing/board and social activities that are formally structured into our programs to facilitate the conduct of research and foster a stronger sense of community and identity among the students as emerging scientists. There will be ample time for questions and discussion following the brief presentations.

Panel Session (Session 3-1)

7 Integrating research and teaching: Using the classroom to feed your scholarship

Organizer: JEFFREY M. OSBORN, Division of Science, Truman State University, 100 E. Normal Street, Kirksville, MO 63501-42121, Tele: (660) 785-4017, Fax: (660) 785-4045, E-mail: josborn@truman.edu.

Although research and teaching are not mutually exclusive academic enterprises, the historical 'teaching vs. research' dichotomy persists on many campuses. This is unfortunate, because there is significant pedagogical value in engaging undergraduates in original scholarly work. A range of academic models exists that provide opportunities to integrate research into the formal curriculum. Some curricula include separate courses such as 'Introduction to Research,' 'Research Techniques,' Research Seminar,' 'Research Capstone,' 'Independent Study,' and/or others of this ilk. These types of courses are valuable and can add significantly to the curriculum, but it is also important to integrate scholarship directly into the core and elective courses. For these, however, true curricular integration does not mean that the research component is simply an 'add-on,' but rather that the scholarly question(s) either is transformed entirely into the course content, or becomes a considerable component of it.

In addition to the pedagogical element, there is practical and administrative value in combining teaching and research efforts at the undergraduate level. At colleges and universities with relatively high teaching loads, particularly baccalaureate and comprehensive institutions, many faculty members find it difficult to maintain a research program during the academic year. By incorporating research into the core and elective courses, a faculty member has the opportunity to remain intellectually engaged in their area of interest, to keep current with the literature, to share budgets, to recruit new students into the lab, etc. This can be especially important for junior faculty.

Several best practice strategies for integrating research and teaching will be briefly presented and there will be ample time for participants to share other models, as well as time for the group to discuss related issues (e.g., grading criteria, how to get "resistant" colleagues or departments on board, etc.).

Breakout Session (Session 5-3)

DEVELOPING EFFECTIVE TEACHING AND MENTORING SKILLS

8 Best practices and biggest challenges in the botanical classroom/lab

Organizer: BEVERLY J. BROWN, Nazareth College of Rochester, 4245 East Avenue, Rochester, NY 14618, Tele: (585) 389-2555, Fax: (585) 586-2452, E-mail: bjbrown@naz.edu.

We probably all have days when we feel born to teach and other days when we wonder why we ever set foot in a classroom. This session will allow attendees to share best practices that they feel really help students understand botanical subject matter. Participants will also have the opportunity to present one of their greatest teaching challenges and draw on the strengths of the group to come up with possible solutions. Participants will be asked to bring at least 20 copies of a one-page handout listing one best practice and one challenge to share with the group.

Breakout Session (Session 5-2)

SUPPORTING EFFECTIVE TEACHING AND LEARNING

9 Making the Most of NSF Division of Undergraduate Education Funding Opportunities

Organizer: KATHERINE DENNISTON, National Science Foundation, Division of Undergraduate Education (DUE), 4201 Wilson Boulevard, Suite 840, Arlington, VA 22230, Tele: (703) 292-4620, Fax: (703) 292-9016, E-mail: kdennist@nsf.gov.

This session will highlight the NSF, Division of Undergraduate Education Course, Curriculum, and Laboratory Improvement (CCLI) program. The goal of the CCLI program is to improve the quality of science, technology, engineering, and mathematics (STEM) education for all students. Targeted activities include improvement of learning environments, course content, curricula, educational practices, and student assessment. In addition, the program seeks to contribute to the relevant research base.

The CCLI program has four tracks: Educational Materials Development (EMD), Adaptation and Implementation (A&I), National Dissemination (ND), and Assessment of Student Achievement (ASA). We will discuss the requirements and guidelines for each of the tracks, as well as the attributes of competitive proposals and the proposal review process.

Informational Session (Session 2-2)

10 Approaches to teaching botany to non-majors

Organizers: DAVID W. LEE and JENNIFER RICHARDS, Department of Biological Sciences, Florida International University, University Park, Miami, FL 33199, Tele: (305) 348-3111 (D. Lee) and (305) 348-3102 (J. Richards), Fax: (305) 348-1986, E-mail: leed@fiu.edu; and richards@fiu.edu.

We have drastically revised both the lectures and laboratories in our non-major introductory botany course, and we would like to share what has and hasn't worked. Our goal in this venue is to evoke responses and communicate ideas that will help participants. We have re-structured our lectures, which are delivered in two 75-minute periods per week. A major change has been to break the lecture into two parts, with various quizzes and activities provided during the middle. Some of these activities require interaction among students. We have modified the laboratory to alternate between inside and outside activities. The outside activities include students tending a vegetable garden and visiting the campus nature preserve. Inside the students grow fast plants, ferns and leaf explants in a growing area in the lab. We have two off-campus field trips, to Fairchild Tropical Garden and Everglades National Park, during the normal lab periods (six lab sections for this course). We have created our own lab manual, which has special relevance to our local environments. This course exposes a wide variety of students to plants and plant-related issues that have meaning in their lives.

Breakout Session (Session 1-2)

11 Attracting botany graduate students to smaller schools

Organizer: BRUCE K. KIRCHOFF, Department of Biology, P.O. Box 26174, University of North Carolina, Greensboro, NC 27402-6174, Tele: (336) 334-4953, Fax: (336) 334-5839, E-mail: kirchoff@uncg.edu.

It can be particularly difficult to attract botany graduate students at smaller schools. The prestige of the institution is often lower, and many times the terminal degree is an MS not a Ph.D. Given these constraints, why do graduate students choose a particular school and professor? During Spring 2003 I surveyed the approximately 30 students enrolled in the Masters program at the University of North Carolina at Greensboro to determine why they selected both UNCG and their major professor. The answers ranged from "I was in Greensboro and wanted to pursue a higher degree" to "I knew their research and wanted to work

on a specific project with them." The session will begin with a brief presentation of the results of this survey, and a solicitation of experiences in attracting graduate students from the audience. The discussion that follows will allow participants to share strategies for attracting students, and will result in a summary that will be distributed to participants following the meeting. Faculty and graduate students from smaller institutions are invited to attend.

Breakout Session (Session 2-3)

12 Facilitating interaction in large lecture courses

Organizer: SUZANNE KOPTUR, Department of Biological Sciences, Florida International University, Miami, FL 33199, Tele: (305) 348-3103, Fax: (305) 348-1986, E-mail: kopturs@fiu.edu.

Small-group interactions and cooperative learning are great techniques for getting students more involved with their own learning in laboratories and lecture classes of modest size, but what about large lecture classes (of 100 students and more)? Years of teaching large, required courses for our major in Biology (most recently and repeatedly, Ecology) has led to an evolution in my own strategies for engaging students in course material and having them feel less like one in a great sea of faces remote from the course lecturer. Breaking up the lecture into several 'chunks', separated by some activity that compels each student to become actively involved with the material has been the major innovation, and has led to greater student attendance, attentiveness, and (by some measures) achievement. Materials available on the course web site promote greater contact with subject matter outside of class, and greater preparation for in class activities. Each student also does a project on different assigned topics, divided into phases, providing ongoing interaction with the instructor or TAs who provide feedback.

Informational Session (Session 3-2)

REACHING OUT BEYOND THE IVORY TOWERS

13 Where's botany in the news? Strategies for linking up with the press

Organizer: SUSAN MILIUS, *Science News*, 1719 N St. NW, Washington, DC 20009, Tele: (202) 872-5124, Fax: (202) 659-0365, E-mail: smilius@sciserv.org.

If you don't mind talking to reporters—that is if you can't beg off and have a root canal or sit through a 5-hour faculty meeting instead—come meet the press and sound off about why. What don't scientists and journalists understand about each other? Could we work together better? Want to know what other life-science professions are doing to attract media relations? And is there anyway to fight the trend that science reporting so often comes to means medical-NASA-and-cute-animal reporting?

Roundtable Session (Session 3-3)

ence for select students and; 5) Follow-up studies and efforts to facilitate transition planning and provide continued enriching experiences for students into the post-secondary environment. The workshops are designed to identify the strengths and interests of the students and to determine a course of action for them to achieve their professional goals. Through these experiences, we emphasize self-determination, self-awareness, and transition planning for moving successfully from high school to university. The capstone of the SIU SY-STEM project is a summer research experience, sponsored by a faculty mentor who integrates the students into his/her research team. An overview of each component of this successful model will be provided.

Informational Session (Session 1-3)

14 The SIU SYSTEM: A model program for supporting youth with disabilities in science

Organizers: KAREN S. RENZAGLIA, Plant Biology Department, Southern Illinois University, Carbondale, IL 62901-6509, Tele: (618) 453-3229, Fax: (618) 453-3441, E-mail: renzaglia@plant.siu.edu; and PAUL E. BATES, Special Education and Educational Psychology, Southern Illinois University, Carbondale, IL 62901-4610, Tele: (618) 453-1814, Fax: (618) 453-7110.

Other Participant: RENEE LOPEZ-SMITH, Plant Biology Department, Southern Illinois University, Carbondale, IL 62901-6509, Tele: (618) 453-3229, Fax: (618) 453-3441.

The SIU SY-STEM (Supporting Youth in Science, Technology, Engineering and Mathematics; www.siu.edu/~system/) is an NSF supported project that provides services, support and learning experiences needed by secondary students with disabilities to pursue careers in STEM disciplines. The project is focused around five highly integrated yet well-defined phases: 1) Talent search through a vast network of contacts and referrals from junior high and high schools in the southern Illinois region; 2) Person-Centered Transition Planning workshops conducted at regional community colleges; 3) Continued contact by role models and mentors with disabilities following the workshops; 4) A Summer Research Experi-

NAME	SESSION	ABSTRACT
Alberts, Bruce	Keynote	NA
Bates, Paul E.	1-3	14
Brown, Beverly J.	5-2	8
Bultman, Tom	3-1	6
Clevinger, Jennifer A.	1-1	4
Cooper, Ranessa L.	4-1	3
Denniston, Katherine	2-2	9
Kirchoff, Bruce K.	2-3	11
Koptur, Suzanne	3-2	12
Lee, David W.	1-2	10
Lopez-Smith, Renee	1-3	14
Markos, Staci	2-1	1
Milius, Susan	3-3	13
Mishler, Brent D.	2-1	1
O'Kelly, Charles J.	2-1	1
Osborn, Jeffrey M.	5-3	7
Renzaglia, Karen S.	1-3, 2-1	1, 14
Rice, Stanley	5-1	2
Richards, Jennifer	1-2	10
Skog, Judith E.	4-2	5
Sundberg, Marshall	3-1	6
Witters, Jeffrey D.	2-1	1

Notes _____



Arthur R. Outlaw Convention Center Floor Plan

